NATIONAL GUIDELINE CLEARINGHOUSE™ (NGC™) GUIDELINE SYNTHESIS

PHARYNGITIS/SORE THROAT

Guidelines

1. *Infectious Diseases Society of America (IDSA). Diagnosis and management of group A streptococcal pharyngitis: a practice guideline. Clin Infect Dis 1997 Sep;27(3):574-83. [58 references]
   CURRENT NGC SUMMARY: Practice guidelines for the diagnosis and management of group A streptococcal pharyngitis. Clin Infect Dis 2002 Jul 15;35(2):113-25 [96 references]
2. University of Michigan Health System (UMHS). Pharyngitis. Ann Arbor (MI): University of Michigan Health System; 2000 Dec. 8 p. [8 references]
3. Scottish Intercollegiate Guidelines Network (SIGN). Management of sore throat and indications for tonsillectomy. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 1999 Jan. 23 p. (SIGN publication; no. 34). [74 references]
4. Institute for Clinical Systems Improvement (ICSI). Acute pharyngitis. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2001 Dec. 24 p. [37 references]
5. American College of Physicians-American Society of Internal Medicine (ACP-ASIM). Principles of appropriate antibiotic use for acute pharyngitis in adults. Ann Intern Med 2001 Mar 20;134(6):506-8 [1 reference]

*__Please note__: The Infectious Diseases Society of America (IDSA) has updated their guideline. The National Guideline Clearinghouse is working to update this synthesis and will post the update as soon as possible.

INTRODUCTION:

Guidelines issued by IDSA, UMHS, ICSI, SIGN, and ACP-ASIM for managing patients with acute pharyngitis (sore throat) in the outpatient setting are compared in the following table. The comparison is restricted to recommendations for uncomplicated cases of acute pharyngitis and does not include recommendations for high-risk patients, patients with severe symptoms such as respiratory distress, or other complicating factors. Local complications of group A beta-hemolytic streptococcal (GABHS) pharyngitis include peritonsillar abscess (quinsy) or retropharyngeal abscess. High-risk patients are those with a personal history or family member with a history of acute rheumatic fever, specifically, those who have had rheumatic carditis or valvular disease. Additional recommendations addressing these patient populations may be found in the individual guidelines.

The evidence supporting the major recommendations is also identified, with the definitions of the rating schemes used by IDSA, UMHS, ICSI and SIGN included in the last row of the table.

Abbreviations used in the text and tables follow:

- ACP-ASIM, American College of Physicians-American Society of Internal Medicine
- ARF, acute rheumatic fever
- GABHS, group A beta-hemolytic streptococcal
- ICSI, Institute for Clinical Systems Improvement
- IDSA, Infectious Diseases Society of America
- RADT, rapid antigen detection test
- RST, rapid strep test
- SIGN, Scottish Intercollegiate Guidelines Network
- UMHS, University of Michigan Health System

Note: To print the following large table, users may have to change their printer settings to landscape, print on legal size paper, and/or use a small font size.

	OBJECTIVE AND SCOPE
IDSA (1997)	• To provide recommendations for the accurate diagnosis and optimal treat group A streptococcal pharyngitis
UMHS (2000)	• To utilize symptoms and signs to determine pretest probability of GABHS • To confirm negative result with culture when strep is suspected and a rap screen is performed • To reduce indiscriminate use of expensive antibiotics • To assure adequate courses of antibiotic treatment • To decrease the occurrence of acute rheumatic fever (ARF)
ICSI (2001)	• To reduce testing of patients for GABHS who present with concomitant vi respiratory infection (VURI) symptoms • To reduce excessive antibiotic treatment through decreased empiric treat patients with pharyngitis • To increase the use of recommended first-line medications for patients wi pharyngitis • To increase patient knowledge about pharyngitis and pharyngitis care
SIGN (1999)	• To suggest a rational approach to the management of acute sore throat i practice • To provide reasonable criteria for referral for tonsillectomy Note: The guideline considers only tonsillectomy for recurring sore throat. It do address tonsillectomy for suspected malignancy or as a treatment for sleep ap peritonsillar abscess, or other conditions.
ACP-ASIM (2001)	• To provide recommendations on appropriate antibiotic use for acute phar adults

TARGET POPULATION	
IDSA (1997)	• United States • Pediatric, adolescent, and adult outpatients with a complaint of sore throa
UMHS (2000)	• United States • Adults, adolescents and children with sore throat
ICSI (2001)	• United States • Patients older than 3 years of age with symptoms of GABHS pharyngitis
SIGN (1999)	• United Kingdom • Patients of all ages presenting with sore throat.
ACP-ASIM (2001)	• United States • Adults (> 18 years of age) with acute pharyngitis
INTERVENTIONS AND PRACTICES CONSIDERED	
IDSA (1997)	**Diagnosis** • Consideration of clinical and epidemiologic features to estimate probabilit GABHS infection. • Laboratory confirmation of possible GABHS pharyngitis: throat culture, ra antigen detection test [RADT, also known as rapid strep test (RST), rapid screen, or rapid antigen screen]. **Treatment** • Symptomatic treatment if diagnosis is confidently excluded on clinical and epidemiological ground or GABHS is ruled out on the basis of laboratory t • Antimicrobial therapy for laboratory confirmed cases of GABHS. • First line: Oral penicillin V or intramuscular benzathine penicillin G; Amoxi young children; Erythromycin for penicillin-allergic patients. • Alternative: First or second generation cephalosporins. **Management** • Management of patients with repeated episodes of acute pharyngitis and or RADTs positive for GABHS.
UMHS (2000)	**Diagnosis**

	• Scoring system for symptoms and signs to determine pretest probability c GABHS. • Laboratory confirmation of intermediate or possibly high probability cases culture, Group A strep antigen screen (rapid strep screen). **Treatment** • Symptomatic treatment for low probability cases and those with negative laboratory results. • Antimicrobial therapy for laboratory confirmed cases or for high probabilit of GABHS. **Preferred:** Oral penicillin V, intramuscular benzathine penicillin G, or amoxicill adolescents and adults; amoxicillin for children; Erythromycin, in penicillin-alle patients. **Alternative:** Augmentin, azithromycin, cefixime, cefuroxime, cephalexin, or clindamycin for adolescents and adults; cefixime, cefuroxime, cephalexin, clinc cefprozil, or cefadroxil for children. **Consultation** • Consultation with otolaryngology for peritonsillar abscess (quinsy) or retropharyngeal abscess.
ICSI (2001)	**Diagnosis** • Clinical assessment. • Laboratory evaluation: throat culture, rapid strep test (RST). **Treatment** • Symptomatic treatment when GABHS is excluded, using home remedies (acetaminophen or ibuprofen, warm salt water gargle, throat lozenges, ha candy, ice, soft foods, cool beverages or warm liquids, flavored frozen de • Antimicrobial therapy for laboratory confirmed cases of GABHS. • First line: Oral penicillin V or intramuscular benzathine penicillin G; erythr in penicillin-allergic patients. Note: amoxicillin and ampicillin are considered but not recommended.
SIGN (1999)	**Diagnosis** • Clinical diagnosis. • Laboratory tests: throat culture, rapid antigen testing. **Treatment** • Management of acute sore throat including simple analgesics (aspirin), n

	steroidal anti-inflammatory agents, and other analgesics (paracetamol wit codeine). • Antibiotics under special circumstances only, for example, severe cases v the practitioner is concerned about the clinical condition of the patient. Pe is the most commonly used antibiotic. **Referral** • Indications for tonsillectomy for recurring sore throat including referral crit otolaryngological assessment.
ACP-ASIM (2001)	**Diagnosis** • No recommendations offered **Treatment** • Symptomatic treatment (analgesics, antipyretics, supportive care) • Antibiotic therapy depending on the likelihood of GABHS: Penicillin; Eryth
DIAGNOSIS	
Clinical Presentation	
IDSA (1997)	The signs and symptoms of group A streptococcal pharyngitis and nonstreptoc pharyngitis (most frequently viral) overlap broadly. The diagnosis of acute group A streptococcal pharyngitis should be suspected clinical and epidemiological grounds. Epidemiological features suggestive of GABHS include: • Children between 5 and 15 years of age. • Seasonal occurrence (winter, early spring) in temperate climates. • Recent close contact with a documented case of streptococcal pharyngiti • Known high prevalence of GABHS infections in the community. Suggestive clinical findings include: • Sudden onset sore throat. • Pain on swallowing. • Fever. Headache, nausea, vomiting and abdominal pain may also be present, especi children. Physical examination reveals tonsillopharyngeal erythema with or wit exudates and tender enlarged anterior cervical lymph nodes (lymphadenitis). However, none of these clinical findings is specific for GABHS pharyngitis and

	may occur with other upper respiratory infections. Conversely, the absence of the presence of clinical features such as conjunctivitis, cough, hoarseness, co anterior stomatitis, discrete ulcerative lesions, viral exanthem, and diarrhea str suggest a viral rather than a streptococcal etiology.
UMHS (2000)	Symptoms/signs can indicate the probability of GABHS, with the probability m accurate for adults than for children. • Adults: a limited set of symptoms and signs can identify a low, intermedia high probability of having GABHS pharyngitis. [evidence: C]. • Children: a limited set of symptoms, signs and epidemiologic criteria can high probability of having GABHS pharyngitis. [evidence: C]. In adults the three findings of fever, tender anterior nodes and swollen exudati tonsils have been demonstrated to have a positive correlation with GABHS. Tv symptoms, cough and post nasal drainage, lower the pretest probability of GA pharyngitis. Recommended scoring system: **For Adults:** Suggestive for GABHS (score +1 for each): • ≤ 3 days of fever > 39 degrees C (101.5 degrees F) • Tender anterior cervical nodes. • Enlarged tonsils with purulent exudates. Suggestive against GABHS (score -1 each): • Postnasal drainage. • Cough. Probability scores: • Low (score = -1, -2) • Intermediate (score = 0, 1, 2) • High (score = 3) **For children:** In children, 1) fever of at least 38.3 in the past 24 hours, 2) age between 5-15 tender anterior cervical nodes, 4) erythema, swelling or exudates on tonsils or and 5) occurrence between November and May, 6) all in the absence of conju cough or rhinorrhea, predicts a positive culture in 75%. Even with 5 of the 6 ab criteria present, a positive culture can be predicted in 59%. All other combinati carry a positive predictive value of less than 50%.
ICSI (2001)	The major issue in most cases of acute pharyngitis is differentiating between G infection and other self-limited etiologies of sore throat, such as viral infection.

	GABHS pharyngitis has a number of characteristic features, including odynopl high fever, scarlatiniform rash, pharyngeal exudates, petechiae on the soft pal tender anterior cervical lymphadenopathy, and malodorous breath. Few patier display all the classic signs and symptoms of GABHS. Symptoms typically associated with GABHS pharyngitis: • Sudden onset of sore throat. • Exudative tonsillitis. • Tender anterior cervical adenopathy. • History of fever. • Headache. • Abdominal pain. Symptoms sometimes associated with streptococcal pharyngitis: • Vomiting. • Malaise. • Anorexia. • Rash or urticaria. Patients with recent strep exposure may be more likely to have streptococcal pharyngitis. Patients with symptoms consistent with a viral upper respiratory tract infection nasal congestion and discharge, cough and hoarseness) are unlikely to have streptococcal pharyngitis. Patients currently on antistreptococcal antibiotics are unlikely to have streptoc pharyngitis.
SIGN (1999)	Clinical examination should not be relied upon to differentiate between viral an bacterial sore throat (evidence level: IIb - grade of recommendation: B). Precise clinical diagnosis is difficult in practice. The clinical picture in an indivic throat is of limited assistance in distinguishing between a bacterial and a viral Studies for sensitivity and specificity suggest that reliance on clinical diagnosis miss 25-50% of GABHS pharyngitis cases and that 20-40% of those with nega throat cultures will be labeled as having GABHS.
ACP-ASIM (2001)	No recommendations offered
Clinical Scoring Systems	
IDSA (1997)	Not recommended. Clinical scoring systems predict positive results of throat cultures or RADTs or of the time. Therefore, unless the diagnosis of group A streptococcal pharyngi be confidently excluded on clinical and epidemiologic grounds, bacteriologic st

	should be performed (category A, grade II)
UMHS (2000)	Recommended for adults (see above). Although the diagnostic impression cannot be used to accurately identify all ca GABHS, higher symptom scores correlate with higher pretest probabilities of C pharyngitis. The high probability group of adults (symptom score of 3) has a pretest probal GABHS of about 28%-67%. They comprise approximately 10%-15% of the ad pharyngitis population. The low probability adult group (symptom scores of -1 or -2) have a pretest pr of 2.5%-4%. They comprise approximately 30% of the adult pharyngitis popula The above probabilities vary with the prevalence of GABHS, which can vary a seasons, between communities, and between sites within a community.
ICSI (2001)	Not recommended. Several scoring systems have been developed to assist in predicting which pa will have a positive throat culture, but none has a high enough predictive value treatment without a positive rapid strep test or strep throat culture. Even with e clinical scoring systems, diagnostic accuracy is only 50%, increasing to 75% if blood cell count results are included in decision making. (Evidence supporting this recommendation is of class: C)
SIGN (1999)	Not recommended. Clinical scoring systems to predict the etiology of sore throat based on sympto complexes such as tonsillar exudate, anterior cervical lymphadenectomy, abse cough, pharyngeal erythema, level of pyrexia and pain are not reliable. Results predictive studies are conflicting and inconclusive.
ACP-ASIM (2001)	No recommendations offered
Laboratory Confirmation of Diagnosis - Who should be tested?	
IDSA (1997)	The diagnosis of GABHS should be suspected on clinical and epidemiological and then supported by the results of a laboratory test. Either a positive throat c rapid antigen detection test (RADT) provides adequate confirmation of the pre group A beta-hemolytic streptococci in the pharynx, but a negative RADT resu be confirmed with a throat culture (category A, grade II). Selective use of diagnostic studies is recommended. Testing usually need not performed for patients with acute pharyngitis whose clinical and epidemiologic features do not suggest a group A streptococcal etiology.
UMHS	Laboratory confirmation is most useful when GABHS is suspected but not high

(2000)	probable. • Adults: test those with intermediate probability. [evidence: C] • Children: test all cases where symptoms are uncertain or suggest GABH the probability level is less certain. Testing is not recommended for adults with low probability of GABHS. Testing recommended for adults with high probability of GABHS unless there are spec reasons to test such as to document the index case to treat close contacts mo rapidly or if standard therapy has failed. Testing is not recommended for children with symptoms that suggest against
ICSI (2001)	Laboratory testing is recommended for patients who present with signs and sy of GABHS pharyngitis. Testing is not recommended for patients with symptom consistent with viral upper respiratory infection or for those currently taking antistreptococcal antibiotics (sulfa medications, nitrofurantoin, and tetracycline another condition. (Evidence supporting this conclusion is of class: C, M, R)
SIGN (1999)	Throat swabs are neither sensitive nor specific for serologically confirmed infe considerably increase costs, may medicalise illness and alter few managemer decisions. Throat swabs or rapid antigen testing should not be carried out routinely in sor (evidence level: III - grade of recommendation: B).
ACP-ASIM (2001)	No recommendations offered
Laboratory utilization - Which test, a rapid strep test [RST; rapid antigen detection test (RADT); rap screen] or throat culture, should be ordered initially?	
IDSA (1997)	Either throat culture or RADT can be used to confirm the diagnosis of GABHS Throat culture is the standard for the confirmation of clinical diagnosis of acute streptococcal pharyngitis with a sensitivity of 90-95% in detecting the presence GABHS (category A grade II). RADTs have excellent specificity (> 95%) when compared with blood agar plate cultures (category A, grade II), but lower sens (80-90%) when compared with blood agar plate cultures (category A, grade II) A negative RADT result should be confirmed with conventional blood agar plat results (category A, grade II). RADT may reduce the risk of the spread of GABHS, allowing these patients to school or work sooner, and can reduce the acute morbidity associated with thi (category A, grade II). The use of RADTs vs. throat cultures for certain populations (e.g., patients see emergency departments) has been shown to significantly increase the numbe

	patients appropriately treated for streptococcal pharyngitis.
UMHS (2000)	Throat culture is the "gold standard" for diagnosis [evidence: C]. Strep screens GABHS more rapidly, but are somewhat less sensitive [evidence: C]. Reserve tests for patients with high probability of having GABHS, culture alone in all oth be most cost effective. In patients where GABHS is suspected and tested with streptococcal antigen screen, a negative result should be confirmed by culture [evidence: C] When a clinician has decided to order a laboratory test to diagnose GABHS, th between starting with an antigen screen or simply obtaining a culture should c the benefits and costs in the context of the individual patient. Early positive dia and initiation of therapy with the use of the RADT may reduce the period of inf and morbidity and may allow the patient to return to normal activity sooner. Ho the value of early diagnosis in the minority of cases when strep is present and identified must be weighed against the higher total laboratory charges for the r of cases screened. Most screens are negative and additional charges will be i for a subsequent culture.
ICSI (2001)	RST is recommended as the initial laboratory test; if RST is negative or not av throat culture is recommended. (Evidence supporting this conclusion is of class: C, M, R) RST has the advantage of nearly 100% specificity; a rapid turn-around-time w reduces unnecessary short-term treatment; it potentially reduces need for call allows the initiation of antibiotic in the timeliest fashion, reducing acute morbidi contagion; and has high patient satisfaction. However, lab costs are increased current technology requires that negative RSTs be backed up with strep throat Other costs (e.g., provider or nurse visits and callbacks) may be significantly r Even though throat culture is not a perfect test it remains the "gold standard" b other diagnostic methods are measured. In addition, it is less expensive to per than RST and is easy to perform in small offices. However, sensitivity is techni dependent. Other limitations of throat culture include delayed initiation of defin treatment due to incubation time delays and reduced patient satisfaction.
SIGN (1999)	Not applicable: Routine laboratory testing with either throat swabs or rapid ant testing is *not* recommended because of poor specificity and sensitivity (eviden III - grade of recommendation: B). Throat swabs are neither sensitive nor specific for serologically confirmed infe because of the relatively high incidence of GABHS carriers. Using throat swab culture as a gold standard to evaluate the performance of R questionable when compared with antistreptolysin O (ASO) titre, which is not i clinically useful in managing acute sore throats.
ACP-ASIM (2001)	• No recommendations offered
TREATMENT	

	Treatment Decisions: • **Who should be treated?** • **When should antibiotics be used?**
IDSA (1997)	Treatment decisions are based on clinical and epidemiological suspicion and r laboratory testing. Antimicrobial therapy is indicated for individuals with symptomatic pharyngitis organism's presence in the throat is confirmed by microbiological or immunolo means. When there is clinical or epidemiological evidence that results in a high index suspicion, antimicrobial therapy can be initiated while laboratory confirmation i pending provided such therapy is discontinued if the diagnosis of streptococca pharyngitis is not confirmed.
UMHS (2000)	Treatment decisions are based on probability of GABHS and results of laborat testing. In adults with low probability of GABHS, symptomatic treatment is recommend In adults with intermediate probability of GABHS, treatment decisions are base results of laboratory testing. If GABHS is confirmed, antibiotic treatment is recommended. If GABHS is ruled out based on culture results, symptomatic tr is recommended. In adults with high probability GABHS pharyngitis, antibiotic treatment is recon without laboratory confirmation, or based on laboratory results in special cases In children with symptoms that are unlikely to be due to GABHS pharyngitis, symptomatic treatment is recommended. In children with uncertain symptoms or symptoms suspicious for GABHS phar treatment decisions are based on results of laboratory testing. If GABHS is co with RADT or culture results, antibiotic treatment is recommended. If GABHS i out based on culture results, symptomatic treatment is recommended.
ICSI (2001)	Treatment decisions are based on clinical assessment and the results of RST culture. If the RST or throat culture is negative, symptomatic treatment (using home re and patient education are recommended. When the RST is positive, antibiotic therapy and patient education are recomn If the RST is negative or not available, treatment decisions should be based o of the throat culture. Generally, treatment should be delayed until these results available. Some clinicians choose to initiate treatment prior to culture result av but a full course of treatment should not be prescribed until culture results con

	presence of GABHS. Empiric treatment of patients with classic streptococcal symptoms in the abser definitive laboratory diagnosis is discouraged.
SIGN (1999)	Diagnosis of sore throat does not mean that an antibiotic has to be administere Adequate analgesia will usually be all that is required. There is insufficient evidence to support a recommendation on the routine use antibiotics in acute sore throat. Antibiotics should NOT be used: • For symptomatic relief (evidence level: Ib - grade of recommendation: A). • Specifically to prevent the development of rheumatic fever or acute glomerulonephritis (evidence level III - grade of recommendation: B). • Routinely to prevent cross infection in the general population (evidence le grade of recommendation: B). • Specifically to prevent suppurative complications (grade of recommendati
ACP-ASIM (2001)	All patients with pharyngitis should be offered appropriate doses of analgesics antipyretics, and other supportive care. Physicians should limit antimicrobial prescriptions to patients who are most like have GABHS. To determine who are the most likely the following strategies ar suggested: a.) Empirical antibiotic treatment of adults with at least three of four clinical criteria (history of fever, tonsillar exudates, tender anterior cervical lymphadenopathy, and absence of cough) and non-treatment of all others. b.) Empirical treatment of adults with all four clinical criteria, rapid antigen testing of patients with three (or perhaps two) clinical criteria, and treatment of those with positive test results and non treatment of all others.
Antibiotic Selection and Duration	
IDSA (1997)	• Patients with acute streptococcal pharyngitis should receive therapy with antimicrobial agent in a dosage and for a duration that is likely to eradicat infecting organism from the pharynx. • On the basis of penicillin's narrow spectrum of antimicrobial activity, the infrequency with which it produces adverse reactions, and its modest cos drug of choice for non-allergic patients (category A, grade II). A 10-day co penicillin is recommended. Intramuscular benzathine penicillin G is prefer patients who are unlikely to complete a full 10-day course of oral therapy (category A, grade II). • Erythromycin is a suitable alternative for patients who are allergic to penic (category A, grade II). First- or second-generation cephalosporins are als

	acceptable for treating patients who do not exhibit immediate hypersensit beta-lactam antibiotics (category A, grade II). • Amoxicillin is often used in place of oral penicillin V in young children. The of amoxicillin appears to be equal to that of penicillin V, and this choice is related to acceptance of the taste of the suspension.
UMHS (2000)	• Penicillin or amoxicillin are the drugs of choice in adults; amoxicillin is the choice for children; erythromycin for patients allergic to penicillin. [evidenc Benzathine penicillin G is recommended for adults or children if complian doubt. • Antibiotic treatment must be carried out for an entire 10-day period for pe [evidence: D], amoxicillin may be given for 6 days in adults [evidence: A] • Alternative treatment regimens for children include cefixime, cefuroxime, cephalexin, clindamycin, and cefprozil, and cefadroxil; for adolescents an Augmentin, azithromycin, cefixime, cefuroxime, cephalexin, and clindamy
ICSI (2001)	• Penicillin is the drug of choice for treatment of culture positive cases of gr beta streptococcal pharyngitis. A 10-day course of penicillin is recommen the possibility of poor compliance is a concern, intramuscular (IM) penicill be advisable. • In penicillin-allergic patients, erythromycin is the drug of choice. If the adv reaction was not anaphylaxis, cephalexin is still a reasonable choice. • In penicillin and erythromycin-allergic patients, consideration should be gi spectrum and cost of antibiotic chosen. • Although the broader spectrum penicillins, such as ampicillin and amoxici often used for treatment of GABHS pharyngitis, they offer no microbiologi advantage over the narrower spectrum penicillin. Although the taste of ar suspension is preferable to penicillin suspension, providers can consider promoting the benefits of twice-daily versus three-times-a-day dosing (no school/daycare dosing), low cost, narrow spectrum and the excellent ther record of penicillin for strep pharyngitis to patients and parents to encoura use. (Evidence supporting this recommendation [use of penicillin] is of class: A, M, (Evidence supporting this recommendation [use of erythromycin] is of class: A
SIGN (1999)	The limited information available is insufficient to support a recommendation o routine use of antibiotics in acute sore throat. • In severe cases, where the practitioner is concerned about the clinical co the patient, antibiotics should not be withheld. Penicillin V 500 mg, four ti for 10 days is the dosage used in the majority of studies. (Good Practice based on the clinical experience of the guideline development group). • Practitioners should be aware that infectious mononucleosis may present severe sore throat with exudate and anterior cervical lymphadenopathy a should avoid prescription of ampicillin based antibiotics, including co-amc as first line treatment. (Good Practice Point, based on the clinical experie the guideline development group).

ACP-ASIM (2001)	The preferred antimicrobial agent for treatment of acute GABHS pharyngitis is penicillin, or erythromycin in penicillin-allergic patients. No recommendations a offered for length of antibiotic therapy.
Benefits of Antibiotics for GABHS	
IDSA (1997)	• Prevention of acute rheumatic fever. • Prevention of suppurative complications. • Abatement of clinical symptoms and signs. • Reduction in transmission of GABHS to close contacts.
UMHS (2000)	• Prevention of acute rheumatic fever. • Duration of illness: Early treatment of GABHS can decrease the time a pa symptomatic by 1/2 - 2 days from a typical 3 - 7 days [evidence: A] and m decrease the period of contagiousness [evidence: C].
ICSI (2001)	• Decrease the incidence of rheumatic fever and suppurative complications patients with group A beta streptococcal pharyngitis. • Minimize secondary spread of illness. • Shorten the course of the illness.
SIGN (1999)	Benefits are limited and may be outweighed by the risks, such as allergy or anaphylaxis.
ACP-ASIM (2001)	• Provide symptom relief by decreasing the duration of some symptoms by days. • Decrease the risk for already rare complications (acute rheumatic fever, a glomerulonephritis), and suppurative complications, such as peritonsillar • Decrease spread of disease in areas of overcrowding or close contact, es if small children may be exposed
EVIDENCE RATING SCHEMES	
Rating Scheme	
IDSA (1997)	**Strength of recommendation:** **A.** Good evidence to support a recommendation for use. **B.** Moderate evidence to support a recommendation for use. **C.** Poor evidence to support a recommendation for or against use. **D.** Moderate evidence to support a recommendation against use.

	E. Good evidence to support a recommendation against use. **Quality of evidence** **I.** Evidence from at least one properly randomized, controlled trial. **II.** Evidence from at least one well-designed clinical trial without randomization cohort or case-controlled analytic studies (preferably from more than one cent from multiple time-series studies or dramatic results from uncontrolled experim **III.** Evidence from opinions of respected authorities based on clinical experienc descriptive studies, or reports of expert committees.
UMHS (2000)	**Levels of evidence:** **A.** Randomized controlled trials. **B.** Controlled trials, no randomization. **C.** Observational trials. **D.** Opinion of expert panel.
ICSI (2001)	**Evidence grading system: Classes of research reports** **A. Primary reports of new data collection:** **Class A:** • Randomized, controlled trial. **Class B:** • Cohort study. **Class C:** • Non-randomized trial with concurrent or historical controls. • Case-control study. • Study of sensitivity and specificity of a diagnostic test. • Population-based descriptive study. **Class D:** • Cross-sectional study. • Case series. • Case report.

	B. Reports that synthesize or reflect upon collections of primary reports **Class M:** • Meta-analysis. • Systematic review • Decision analysis. • Cost-benefit analysis. • Cost-effectiveness study. **Class R:** • Narrative review. • Consensus statement. • Consensus report. **Class X:** • Medical opinion.
SIGN (1999)	**Grades of recommendation:** **A.** Requires at least one randomized controlled trial as part of a body of literatu overall good quality and consistency addressing the specific recommendation. (Evidence levels Ia, Ib) **B.** Requires the availability of well conducted clinical studies but no randomize trials on the topic of recommendation. (Evidence levels IIa, IIb, III) **C.** Requires evidence obtained from expert committee reports or opinions and clinical experiences of respected authorities. Indicates an absence of directly applicable clinical studies of good quality. (Evidence level IV) **Statements of evidence** **Ia.** Evidence obtained from meta-analysis of randomized controlled trials. **Ib.** Evidence obtained from at least one randomized controlled trial. **IIa.** Evidence obtained from at least one well-designed controlled study withou randomization. **IIb.** Evidence obtained from at least one other type of well-designed quasi-experimental study. **III.** Evidence obtained from well-designed non-experimental descriptive studies as comparative studies, correlation studies and case studies. **IV.** Evidence obtained from expert committee reports or opinions and/or clinica

	experiences of respected authorities.

GUIDELINE CONTENT COMPARISON

The Infectious Diseases Society of America (IDSA), the University of Michigan Health Systems (UMHS), the Institute for Clinical Systems Improvement (ICSI), the Scottish Intercollegiate Guidelines Network (SIGN), and the American College of Physicians-American Society of Internal Medicine (ACP-ASIM) present recommendations for managing acute pharyngitis in adults in the primary care setting. IDSA, UMHS, ICSI, and SIGN also address the pediatric population and include diagnostic testing recommendations. IDSA, UMHS, ICSI, and SIGN provide explicit reasoning behind their judgments, rating the evidence upon which recommendations are based. Although ACP-ASIM does not offer an evidence-rating scheme, their guideline is accompanied by a background paper, part 2 of the clinical practice guideline, that supports their management recommendations [Cooper RJ, Hoffman JR, Bartlett JG, Besser RE, Gonzales R, Hickner JM, Sande MA. Principles of appropriate antibiotic use for acute pharyngitis in adults: background. Ann Intern Med 2001 Mar 20;134(6):509-17].

SIGN also issues recommendations regarding tonsillectomy for recurrent sore throat in children and adults. ICSI and IDSA briefly address surgical treatment for recurrent pharyngitis, although ICSI emphasizes that the topic is beyond the scope of their guideline. UMHS and ACP-ASIM do not discuss indications for elective tonsillectomy. IDSA contains more detailed information regarding variables affecting throat culture and laboratory results than the other organizations. IDSA also details recommendations for repeated diagnostic testing and management of patients with repeated episodes of acute pharyngitis and positive laboratory tests for GABHS. To aid implementation and evaluation of their respective guidelines, IDSA describes indicators of quality care, SIGN lists key points for audit, and ICSI defines measures to determine the progress in achieving their primary objectives. UMHS and ICSI present their recommendations for managing adult and pediatric pharyngitis in detailed algorithms, facilitating their use by clinicians. SIGN, UMHS and ICSI provide information regarding patient education on sore throat and associated treatments.

Areas of Agreement

UMHS, IDSA, ICSI, and ACP-ASIM each recommend antibiotic treatment of GABHS pharyngitis, to prevent acute rheumatic fever and to shorten the duration of signs and symptoms. Similar features of the diagnostic testing strategies proposed by UMHS, IDSA, and ICSI, include selective use of laboratory tests (RADT and throat culture) for patients suspected of having GABHS pharyngitis. Management strategies for pharyngitis presented by ACP-ASIM, ICSI, IDSA and UMHS share a common goal of refraining from antibiotic treatment if GABHS infection is an unlikely cause.

ACP-ASIM, ICSI and IDSA agree the antibiotic of choice to treat GABHS pharyngitis in non-allergic adults is penicillin, with most groups citing its proven efficacy in eradicating the organism from the oropharynx, safety

profile, low cost, and narrow spectrum. UMHS recommends either penicillin or amoxicillin as antibiotics of choice to treat GABHS pharyngitis in non-allergic adults, citing a French trial of amoxicillin which found clinical and microbiological outcomes equivalent to penicillin.

Pediatric recommendations are provided by UMHS, ICSI and IDSA. UMHS' recommendations for children are similar to ICSI's and IDSA's recommendations for all ages, in that patients are classified into two general categories according to whether they have symptoms consistent with GABHS pharyngitis or suggesting against GABHS pharyngitis. Unless the diagnosis of GABHS can be confidently excluded on the basis of clinical and/or epidemiological grounds, UMHS, ICSI and IDSA recommend laboratory testing to ensure appropriate treatment of children. These groups advise that negative results obtained with rapid strep tests require confirmation with throat culture, due to the lower sensitivity of the screening test.

Areas of Differences

Perspective on Acute Rheumatic Fever

The most dramatic difference among these recommendations reflects the nationality of the organizations: IDSA, UMHS, ICSI, and ACP-ASIM represent perspectives from the United States; SIGN, a Scottish viewpoint. According to three of the American organizations, IDSA, UMHS and ICSI, the primary importance of diagnosing and treating GABHS pharyngitis is to prevent acute rheumatic fever in children and adults. ACP-ASIM also acknowledges that antibiotic treatment of GABHS leads to a decreased risk for already rare complications in adults. Three of the four American organizations present diagnostic strategies for laboratory testing while all four provide recommendations for antibiotic treatment of GABHS pharyngitis. (See Diagnostic Strategies and Treatment Decisions below.)

SIGN, on the other hand, does not recommend laboratory testing or antibiotic treatment for sore throat.

SIGN questions the clinical utility of throat culture to diagnose GABHS pharyngitis, concluding throat swabs are neither sensitive nor specific for serologically confirmed infection, considerably increase costs, and alter few management decisions. Furthermore, SIGN rejects the clinical rationale to treat GABHS pharyngitis in order to prevent acute rheumatic fever based on epidemiological differences between the United States and the United Kingdom. They acknowledge that outbreaks of rheumatic fever are still reported in both children and adults in the United States. However, they point out that the incidence of rheumatic fever in the UK is extremely low. SIGN concludes there is no support in the literature for the routine treatment of sore throat with penicillin to prevent the development of rheumatic fever.

Diagnostic Strategies and Treatment Decisions

Recommendations for diagnostic strategies and treatment decisions are provided by IDSA, ICSI, and UMHS; ACP-ASIM provides treatment recommendations only.

Diagnostic Strategies

UMHS recommends stratifying adults according to the prior probability of disease by using a simple clinical scoring system. Laboratory testing and antibiotic treatment decisions for adults are guided by these probability estimates: high probability patients should be immediately treated without undergoing laboratory testing, intermediate probability patients should be tested and treated according to laboratory results, low probability patients should not be tested or treated. UMHS identifies the advantages of this scheme:

- If all high probability adults are not tested, but immediately treated, about 1-5% of the population would be over-treated; however, expensive testing would be avoided for everyone in the 10-15% of the adult pharyngitis population that falls into this group.
- Testing all intermediate probability adults will assure appropriate treatment for the 55% of the population that falls into this group. The substantial minority with GABHS will be appropriately treated and the majority will not be over treated with antibiotics.
- If all low probability adults are not tested and not treated, about 1% of the population would have GABHS and would not be treated. However, expensive testing would be avoided for everyone in the 30% of the adult pharyngitis population that falls into this group. If a physician elects to perform a rapid strep test on a low risk patient and the result is negative, only 0.3% of those patients would have GABHS. Confirming cultures would not be necessary.

In contrast, neither IDSA nor ICSI countenance clinical scoring systems. Both groups, however, recommend classifying patients into two groups based on the likelihood of GABHS pharyngitis versus viral infection or other etiology. To favor the diagnosis of GABHS pharyngitis, IDSA considers suggestive clinical findings, such as sudden onset of sore throat, pain on swallowing, and fever, as well as epidemiological features, such as age (5-15 years old), seasonal occurrence, and exposure to GABHS. ICSI also considers characteristic clinical features of GABHS as well as age (>3 years old) and exposure to GABHS. Both groups discuss symptom profiles that are more consistent with viral infection than GABHS infection, such as cough and nasal congestion. ICSI also emphasizes that a patient taking antistreptococcal antibiotics for other conditions is unlikely to have GABHS pharyngitis. IDSA concludes laboratory testing and antimicrobial therapy is not indicated if the diagnosis can be confidently excluded on clinical and epidemiological grounds. For all other patients with possible GABHS pharyngitis, laboratory testing is recommended to determine appropriateness of antibiotic therapy. Similarly, ICSI recommends laboratory testing only for those individuals with symptoms consistent with GABHS pharyngitis and advises providers to triage patients with symptoms of VURI through their separate guidelines on the topic.

Treatment Decisions

UMHS recommends immediate treatment of high probability cases without laboratory testing, but allows for limited testing in this group in special circumstances, such as to document index cases so that close contacts may be treated more rapidly, in the event of failure of standard therapy, or to avoid a potential antibiotic reaction. In direct contrast to UMHS, IDSA and ICSI discourage empiric treatment in the absence of laboratory confirmation and recommend antimicrobial therapy only for those with a positive rapid strep test or throat culture result. IDSA allows for initiation of antimicrobial therapy for

cases with a high index of suspicion; however, a laboratory test is still recommended so that therapy may be discontinued if the diagnosis of streptococcal pharyngitis is not confirmed. ICSI also emphasizes that a full course of treatment should not be prescribed until laboratory test results confirm the presence of GABHS. ICSI, IDSA, and UMHS, recommend against laboratory testing and antibiotic treatment for adults who are unlikely to have GABHS pharyngitis. UMHS uses a clinical scoring system to identify this low probability group; whereas, IDSA and ICSI more subjectively consider the spectrum of clinical and epidemiologic features that suggest a viral rather than a streptococcal etiology.

ACP-ASIM recommends analgesics, antipyretics, and other supportive care for all patients with pharyngitis. Recommendations are made for antibiotic therapy limited to those patients most likely to have GABHS pharyngitis. Although ACP-ASIM does not recommend one strategy to determine that likelihood, they offer two strategies to guide treatment decisions: (1) Empirical antibiotic treatment of adults with at least three of four clinical criteria (history of fever, tonsillar exudates, tender anterior cervical lymphadenopathy, and absence of cough) and non-treatment of all others; or (2) Empirical treatment of adults with all four clinical criteria, rapid antigen testing of patients with three (or perhaps two) clinical criteria, and treatment of those with positive test results and non treatment of all others. Finally, this group recommends penicillin, or erythromycin in penicillin-allergic patients, as first-line therapy for acute GABHS pharyngitis.

Although the assessment of the likelihood of GABHS pharyngitis differs among the organizations, the general management strategies of these four organizations can be summarized in the following Table:

<table>
<tr><td></td><td colspan="3">Likelihood of GABHS Pharyngitis, as Defined in Each Guideline</td></tr>
<tr><td></td><td>High</td><td>Intermediate</td><td>Low</td></tr>
<tr><td rowspan="3">ACP-ASIM</td><td colspan="2">Empirical treatment without laboratory testing of adults with at least 3 of 4 clinical criteria (fever, tonsillar exudate, lymphadenopathy, absent cough)</td><td>No laboratory and no antimi treatment</td></tr>
<tr><td colspan="3">OR</td></tr>
<tr><td>Empirical treatment of adults with all four clinical criteria</td><td>RADT of patients with 2 or 3 of 4 clinical criteria; Treat those with a positive test, nontreatment of others</td><td>No laboratory and no antimi treatment</td></tr>
<tr><td>ICSI</td><td colspan="2">• Laboratory testing (RADT or throat culture) of patients with symptoms consistent with GABHS
• Antimicrobial treatment of laboratory confirmed cases</td><td>No laboratory and no antimi treatment</td></tr>
<tr><td>IDSA</td><td colspan="2">• Laboratory testing (RADT or throat culture) of patients with clinical findings and epidemiological features suggestive of GABHS</td><td>No laboratory and no antimi treatment</td></tr>
</table>

	• Antimicrobial treatment of laboratory confirmed cases		
UMHS	Based on clinical scoring system, empiric antibiotic treatment without laboratory testing in most cases	Laboratory testing (RADT or throat culture), negative RADTs require confirmation with throat culture; Treat those with a positive test	No laboratory and no antimi treatment

In conclusion, ICSI, IDSA, and UMHS strive to balance laboratory utilization and antibiotic usage through different means. UMHS eliminates laboratory testing for patients with a high probability of GABHS pharyngitis, favoring empiric antibiotic treatment for this group and limiting laboratory testing to those adults in the intermediate probability category. With IDSA's strategy, more laboratory tests will be performed than with UMHS' approach, because IDSA calls for testing patients characterized as high probability as well as those in the intermediate category in UMHS' scheme. However, because clinical suspicion is always followed-up with a laboratory test with IDSA's approach, fewer patients will be inappropriately treated with antibiotics. ICSI's strategy attempts to reduce testing among patients who are more likely to have a viral upper respiratory tract infection than GABHS pharyngitis. Like IDSA's approach, ICSI recommendations correspond to testing high probability patients and a proportion of intermediate probability patients in UMHS' scheme and reducing excessive antibiotic treatment through decreased empiric treatment. Each strategy involves a tradeoff between the expense of performing additional laboratory tests versus the risk of over-treating a proportion of patients with antibiotics. Because laboratory utilization and diagnostic strategies are not the focus of their guideline, ACP-ASIM offers treatment recommendations only. All the guidelines target antimicrobial treatment to those most likely to have GABHS pharyngitis and aim to decrease excessive antibiotic use.

Choice of Antibiotics For Children

IDSA, ICSI, and UMHS's stance on the use of broader spectrum penicillin congeners (i.e., amoxicillin) for children differs. UMHS recommends amoxicillin rather than penicillin for children with GABHS pharyngitis, despite its higher cost, because the drug may have higher compliance due to its better taste. Although IDSA recommends penicillin as first-line treatment for children, they note with a neutral tone that amoxicillin is often used in place of oral penicillin V in young children, and this choice is primarily related to acceptance of the taste of the suspension. The efficacy of amoxicillin, IDSA comments, appears to be equal to that of penicillin V. ICSI acknowledges that the broader spectrum penicillins are often used for treatment of GABHS in children, however, they conclude that amoxicillin and ampicillin offer no microbiologic advantage over penicillin. Recognizing the taste preference of amoxicillin over penicillin, ICSI offers suggestions to encourage the use of penicillin: providers can consider promoting the benefits of twice-daily versus three-times-a-day dosing (no school/daycare dosing), low cost, narrow spectrum, and the excellent therapeutic record of penicillin for strep pharyngitis. Consequently, ICSI recommends penicillin, not amoxicillin, for all patients 3 years of age or older with GABHS pharyngitis. ACP-ASIM does not address a pediatric population.

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